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Commonwealth SIDS and UK Overseas Territories sustainable fisheries programmes: An overview of projects and benefits of official development assistance funding

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ABSTRACT

In recent years, Official Development Assistance (ODA) funding has decreased for sustainable fisheries projects worldwide. However, the UK Government has committed to ringfencing 0.7% GDP to international development assistance to support a large range of programmes worldwide including, where appropriate, sustainable fisheries and aquaculture capacity building in Overseas Territories and the Commonwealth. This is with the aim of reducing poverty, increasing resilience in the fisheries sector to climate change impacts and increasing food security.

The primary objective of this paper is to demonstrate the significant support by UK Government to the Commonwealth Small Island Developing States (SIDS) and UK Overseas Territories (OT) and the impacts of such interventions. This support is illustrated through an introduction to the Commonwealth Marine Economies programme and the Blue Belt programme.

In this paper the emerging trends for ODA support are set out, then the importance of fisheries to a selection of ODA-eligible states is highlighted. Finally, illustrative examples of projects from two key UK Government programmes in Commonwealth states and UK Overseas Territories that demonstrate a wide range of potential capacity building support activities and derived benefits to the states are summarised. We explain how activities to sustainably develop the fisheries sector in Commonwealth Small Island Developing States (SIDS) and UK Overseas Territories (OT) enhance biodiversity protection and create opportunities to support 'Blue Growth' (the long-term strategy to support sustainable growth in the marine sectors).

1. Introduction

In recent years, official development assistance (ODA) funding has decreased for sustainable fisheries projects worldwide while it has increased for non-fisheries sectors [1]. Blasiak and Wabnitz (op. cit.) found the decrease to be 30% over 2010–2015 while the increase in non-fisheries ODA was 13%. FAO [2] reported that ODA directed to the agricultural sector (fisheries and forestry included) declined from 19% in 1990 to 5% in 2009 and has remained relatively stable according to the latest data available.[1] For Small Island Developing States (SIDS), the UN records 56 States across the world that qualify as such and Organization for Economic Co-operation and Development (OECD) data from the Creditor Reporting System for the period between 2007 and 2016 are available for 48 of those states. During that period, ODA for all agricultural sectors (agriculture, forestry and fisheries) has fluctuated but a negative trend is observed in recent years. Similarly, ODA for fisheries (including ODA for fishing policy and administrative management, fishery development, fishery education/training, fishery research and fishery services) follows a similar pattern (see Fig. 1). Fisheries ODA has not accounted for more than 50% of the total ODA for agriculture and on average for the 2007–2016 period it was around 31%. The average aid budget received for fisheries by the 48 countries

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[1] Source: Development flows to agriculture FAO Investment Financing Dataset, September 2016 Global overview http://www.fao.org/economic/ess/investment/flows/en/.

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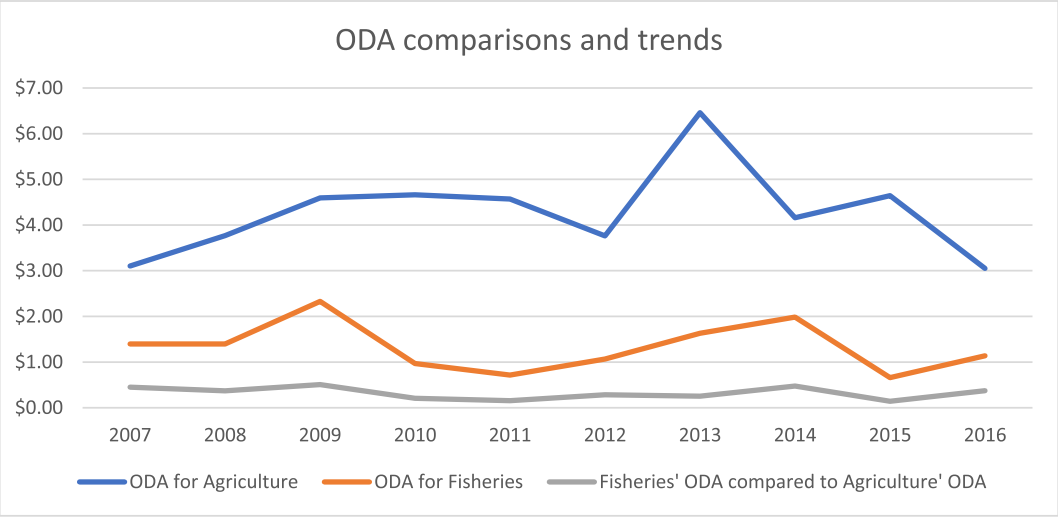

Fig. 1. Trends in Agriculture and Fisheries ODA for 2007–2016 in 48 SIDS, in US$ million (source: Creditor Reporting System (CRS) OECD https://stats.oecd.org/Index.aspx?DataSetCode=CRS1.

for that period was USD 1.3 million. However, the UK Government has committed to ringfencing 0.7% Gross Domestic Product (GDP) to support a large range of programmes worldwide including, where appropriate, sustainable fisheries and aquaculture capacity building in Overseas Territories (OT) and the Commonwealth SIDS. This is with the aim of reducing poverty, increasing resilience in the fisheries sector to climate change impacts, and increasing food security. Recent reviews have also demonstrated the importance of fisheries in supporting employment [3] and providing nutrition to vulnerable coastal communities [4,5].

ODA is a vital component for achieving the Sustainable Development Goals[2] (SDGs), with goal 2.a.2 focusing on official flows to the agriculture sector which include fisheries and aquaculture. Also, the sustainable fisheries components of current UK Government overseas programmes contribute to international agreements e.g. goal No. 14.b.1 regarding the: "Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries."

1.1. The importance of fisheries in selected ODA-eligible states

Some key facts and figures that underline the importance of the fishing sector to employment and national Gross Domestic Product (GDP) in selected states are presented in Table 1 below. The states selected are those that form the majority of the case study examples presented in section 3.

Of the selected states, fisheries contribute the biggest amount to the GDP in Dominica (42%) but in other countries contribution varies between 0.4% and 1.8%. Nevertheless, Jamaica has the largest number of people employed in the sector (23,000), followed by Guyana (7,500).

The primary objective of this paper is to highlight the significant support by UK Government to the Commonwealth SIDS and Overseas Territories (OT) afforded through the Commonwealth Marine Economies programme and the Blue Belt programme. Due to the difference in the maturity of these two different programmes and the different focus on fisheries capacity building in certain regions, this paper principally uses examples from Commonwealth Caribbean SIDS to illustrate the importance of fisheries to local populations and as case studies of the projects that have been initiated. Results of individual projects are not presented due to the mid-programme status of many of the activities. However, a description of the benefits derived from these fisheries capacity building activities are provided.

Further, within each of the programmes we acknowledge the importance of working with key regional and national bodies to develop capacity and drive the transition from marine-based to knowledge-based economies enabling these islands to sustainably maximise opportunities within their territorial waters. These partnerships are essential in ensuring that the programme activities are priorities for the states, ensure uptake of the newly developed capacity and avoid displacing national policy priorities with donor focussed interests.

2. Background to UK government ODA initiatives

While separate terminologies exist to define states as either SIDS or UKOTs within the programmes described in this paper, they share many characteristics. These countries and territories tend to be small and isolated with large marine areas and significant resources. Many tend to have narrow economic bases with relatively small populations and the limited capacity (human resources and infrastructure) to manage and sustainably develop their maritime sectors.

Although they face challenges, these states have strong potential for economic development based on greater, and better informed, use of their marine resources. Under the United Nations Convention on the Law of the Sea (UNCLOS), many SIDS possess large Exclusive Economic Zones (EEZs) that contain considerable natural resources. For example, Tuvalu's EEZ is 27,000 times the size of its land area, and Kiribati has an EEZ that is larger than the EEZ of the Peoples' Republic of China.

These areas have enormous development potential for sustainable fishing, tourism, shipping and mineral exploitation. However due to their low-level of economic development and lack of training and education, resources these countries have been unable to afford investment in surveying and scientific research in these areas, so they have missed out on major opportunities for economic development and job creation.

2.1. The Commonwealth Marine Economies (CME) programme

CME[3] was launched by the then UK Prime Minister David Cameron MP at the 2015 Commonwealth Heads of Government Summit in Malta. This Programme is an intervention to expand, in line with SDG 14, trading capacity and the economic base of the 17 economically

[2] https://sustainabledevelopment.un.org/sdgs.

[3] https://www.gov.uk/guidance/commonwealth-marine-economies-programme.

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Table 1
Summary statistics for the fishery sector in selected SIDS.
Sources: World Bank https://data.worldbank.org/indicator and FAO country profiles, Fisheries and Aquaculture http://www.fao.org/fishery/countryprofiles/search/en Foreign Commonwealth Office The Overseas Territories Security, Success and Sustainability, 2012

	Employment (thousands) in 2014[a]	Total GVA value (US$ billion)	GDP (US$ billion)	Fisheries as percentage of GDP	Latest year that GDP values were available
Belize	2.43	0.030	1.706	1.8%	2014
Dominica	1.34[b]	0.204	0.486	42.0%	2012
Guyana	7.5	0.055	3.078	1.8%	2014
Jamaica	23.21	0.053	13.192	0.4%	2010
St Lucia	2.96	0.011	1.437	0.8%	2012

[a] Accounting for employment both in wild and aquaculture fisheries.
[b] Latest year with data available was 2013.

marginalised states that are in scope.[4] Commonwealth states in the Pacific and Caribbean that meet the criteria to receive ODA funding. The current list of ODA eligible SIDS are Antigua and Barbuda; Belize; Dominica; Grenada; Guyana; Fiji; Jamaica; Kiribati; Nauru; Papua New Guinea; Saint Lucia; Saint Vincent and the Grenadines; Samoa; Solomon Islands; Tonga; Tuvalu; Vanuatu. It is worth noting that this list includes continental coastal states (Guyana and Belize). This was due to the scope of the CME Programme as originally defined with both states providing institutional hubs on either side of the wider Caribbean.

The CME programme's primary objective is to provide Commonwealth SIDS with accurate hydrographic and scientific data relating to their marine environment, as well as training and capacity building for national bodies involved in the research and management of marine resources. This will enable relevant national and regional bodies to use the data to promote sustainable economic growth and development and alleviate poverty. With few land resources, but expansive EEZs, compelling opportunities for economic development open to SIDS are derived from their marine environments.

The Programme utilises UK expertise in marine science and hydrography: The Programme is delivered through a Memorandum of Understanding with the UK Hydrographic Office (part of the Ministry of Defence), the Centre for Environment, Fisheries and Aquaculture Science (Cefas), an agency of the Department for Environment, Food and Rural Affairs, and the National Oceanography Centre (a Department for Business, Energy and Industrial Strategy-funded Non-Departmental Public Body).

From the outset of the CME Programme the UK agencies developed partnerships with key regional and national bodies to ensure that the prioritised projects were relevant, and local expertise and networks were not circumvented. The development of these partnerships was principally facilitated through regional workshops, bi-lateral meetings, Memoranda of Understanding between government agencies and established networks (e.g. Foreign and Commonwealth Office, British High Commissions etc.).

2.2. UKOT Blue Belt

The UKOT Blue Belt Programme[5] was initiated to support those UKOTs that had already established, or made a commitment to establish, large-scale marine protected areas (or strategies) in the waters under their jurisdiction. The programme followed the announcement at the Our Oceans Conference in Washington in September 2015 of the UK's commitment to create a “Blue Belt” of marine protection around its OTs (ref Alan Duncan speech).

The programme is utilising UK expertise to support five UKOTs (British Antarctic Territory, British Indian Ocean Territory, Pitcairn Islands, South Georgia & the South Sandwich Islands and St Helena, Tristan da Cunha & Ascension Island) to manage their marine environments. Of these OTs, only Pitcairn Islands and St Helena and Tristan da Cunha (part of St Helena, Tristan da Cunha and Ascension Island) qualify for ODA support.

3. Case studies in SIDS and UKOTs

The following text provides some high-level descriptions of selected projects within the SIDS and OTs. The intention is not to provide either a comprehensive description of all the projects or a summary of results (with many of the projects described currently ongoing). Rather the intention is to provide the reader with an understanding of the wide variety of fisheries related activity supported by the UK in the Caribbean and Pacific (with a focus on the Caribbean). It should be noted that while the project examples provided in this paper (on Marine Stewardship Council certification, fisheries management, aquaculture and climate change) the programmes presented encompass many other types of capacity building in e.g. bathymetric charting, habitat mapping, water quality, pollution monitoring (including marine litter), environmental economics and non-native species.

3.1. Marine Stewardship Council (MSC) certification of fisheries

The Marine Stewardship Council (MSC)[6] is an international non-profit organization established to address the problem of unsustainable fishing and to safeguard seafood supplies for the future (www.msc.org). It runs a standard-setting and eco-labelling program for wild capture fisheries. For a fishery to attain MSC certification, it must meet the MSC Fisheries Standard, which is based upon the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries [6]. Fisheries assessed against the standard by Conformity Assessment Bodies (CABS), receive certificates issued by CABs, allowing these fisheries to claim that they are sustainable and sustainably managed (Table 2, [6,7].

The following section highlights some recent MSC-related support within the CME programme in both Guyana and Jamaica.

3.1.1. Guyana

The Atlantic seabob (*Xiphopenaeus kroyeri*) (a type of shrimp) is Guyana's most valuable seafood export ranking fifth among all its exports. Almost all seabob harvested by the industrial trawl fishery is exported to the United States and the European Union, with a value of approximately US$45 million annually [8,9].

Increasingly, customers of Guyana's seabob are demanding MSC certification. This has been recognised by the Government of Guyana and they have therefore asked for enabling support to apply for MSC certification.

Through the CME programme, Cefas is providing expert technical support to Guyana towards attaining MSC certification for the seabob

[4] http://www.oecd.org/dac/stats/officialdevelopmentassistancedefinitionandcoverage.html.
[5] https://www.gov.uk/government/publications/the-blue-belt-programme.
[6] https://www.msc.org/en-us.

Table 2
Principles that make up the MSC Fisheries Standard taken from MSC Fisheries Certification Requirements v2.0 page 6, 2014.

Principle 1	Sustainable fish stocks	Fisheries must operate in a way that allows fishing to continue indefinitely, without over exploiting the resources
Principle 2	Minimising environmental impacts	Fishing operations need to be managed to maintain the structure, productivity, function and diversity of the ecosystem upon which the fishery depends, including other species and habitats.
Principle 3	Effective management	All fisheries need to meet all local, national and international laws and have an effective management system in place.

trawl fishery. In line with the objectives of CME, the programme is also building the Fisheries Department's capacity for more efficient independent future progress on their ongoing fisheries improvement project (FIP) and in fisheries management. The CME Programme has:

i) provided an expert external review of key documentation and data (target and by-catch species and habitat data) required for MSC certification; and
ii) provided training to Fisheries Department personnel in stock assessment, habitat mapping and monitoring approaches (observer programmes).

All of these activities have been requested by the local stakeholders to assist in their MSC application process. Therefore, the expected results of the project are increased opportunities for access to existing and new markets [8,10]. The intervention was requested as while the industry and government were supportive of certification there was not enough expertise or capacity in the country to enable this process to be carried out.

3.1.2. Jamaica

Queen conch is considered Jamaica's most important fishery resource with estimated gross revenues of 3 million USD per year and employment of an estimated 2,000 people [11]. Further, through an export levy the queen conch fishery provides critical funding for fisheries management through the Fisheries Management Development Fund. The majority of queen conch is exported, primarily to the US and EU as frozen product, generally as '50% cleaned' (viscera and operculum removed) [11].

While stakeholders see the benefits of MSC accreditation they were not clear on how they can meet the requirements. In particular, what the MSC certification process entails, the financial resources required to undertake the initiative and the level of input required from fisheries staff.

Technical support is being provided to Jamaica to identify any potential issues identified by MSC Conformity Assessment Bodies that would prevent certification. Where issues exist, an action plan to address specific barriers is being developed by the fisheries division with input from the Cefas scientists. In parallel with the support towards MSC certification, training is also being provided to fisheries division staff in stock assessment, habitat mapping and other key science areas in fisheries management. These key areas of expertise are required to enable continued onward activities to support application but also ongoing certification.

Benefits of certification may include increased market price and/or future access to existing and new markets. The intervention was requested as there was not enough expertise and capacity in the country to enable this certification process to be carried out.

3.2. Fisheries management

In the OTs a range of project activities are ongoing that support the enhancement of biodiversity protection. Some of these activities are focussed on fisheries management.

Tristan da Cunha is part of the UKOT of St Helena, Tristan da Cunha and Ascension. It is home to 261 inhabitants and annual bilateral assistance from the UK exists in the form of medical care, assistance with education, public reforms and educational needs [12].

Tristan da Cunha is heavily reliant on a single MSC certified fishery for Tristan lobster *Jasus tristani*. The Tristan lobster is caught around the four islands of the archipelago using traps and hoop nets (Collins, 2017). The fishery is managed through an annual total allowable catch (TAC), which is fished around the only inhabited island in the group, Tristan da Cunha, by a fleet of 12 inshore vessels. The TAC around the remaining three islands is accessed by licence concession to a single vessel. The licensing fees and share of sale of produce resulting from the fishery amounts to between 60 and 65% of the total income for the territory, based on 2017 data (D. Moores 2018, *pers. comm.*). Additionally, the licence holder in the fishery provides a series of services to the island such as passenger transport and shipment of cargo, including fuel.

A second fishery, for bluenose warehou (*Hyperoglyphe Antarctica)*, is under development as an additional source of income with trawl and longline licences provided to target this resource on the seamounts within the Tristan EEZ. There is limited information on the status of this species in Tristan waters. Tristan da Cunha has also issued occasional licences for vessels to fish for southern bluefin tuna (*Thunnus thynnus*) in the southern part of the EEZ.

Tristan da Cunha has committed to establishing a protection strategy for the marine environment that permits sustainable fishing activities with the intention of certifying all fisheries under MSC. The Blue Belt Programme is using an evidence-based approach to inform the design of marine protection strategy options for the Tristan da Cunha Island Council to consider in the lead up to designation in 2020 and to feed in to management plans for governance into the future. This requires the provision of additional expert capacity in the short term to generate the products, such as initial stock assessments and population parameters of target species as well as protocols for monitoring and enforcement. The marine protection strategy will be a locally-led process and will require increasing levels of community engagement as the evidence is collected to report the findings appropriately so that decisions are community inclusive, and considerate of local requirements.

The Blue Belt Programme is supporting a broad range of work to assist the Tristan da Cunha Government to manage and protect its marine environment. This includes:

i) research surveys to investigate the biodiversity and ecology of the marine ecosystem;
ii) surveys on commercial fishing vessels to collect data on bluenose warehou that will lead to a stock assessment and establishment of precautionary catch limits;
iii) advice on licencing arrangements for fishing vessels and on observer protocols;
iv) independent peer review of the lobster stock assessment; and
v) surveillance of the Tristan EEZ to identify and tackle any illegal fishing.

Therefore, the benefits derived through the Blue Belt Programme include an understanding of how to characterise and protect the marine environment, and how to sustainably utilise and manage marine resources. The intervention was requested as there was not adequate expertise and capacity in the state to enable this process to be carried out.

3.3. Aquaculture

The global population is likely to rise from 7 billion in 2011 to nearly 10 billion by 2050 [13] with the major increase occurring in developing countries, including in the Caribbean. With the projected population increases and the impact of a growing tourism industry, there is likely to be an increased demand for food, in particular fish and shellfish, and an increase in food insecurity. Fish and shellfish can play a major role in reducing malnutrition and reduce food import costs. With fisheries unable to keep up with the growing demand for seafood, aquaculture has expanded and further expansion is needed in developing regions such as the Caribbean. In fact, the Caribbean Regional Fisheries Mechanism (CRFM) Strategic Plan 2013–2021 [14] considers sustainable expansion and intensification of fish production through responsible aquaculture a major objective.

3.3.1. St Lucia

The Caribbean spiny lobster (*Panulirus argus*) supports an iconic fishery throughout the wider Caribbean. Between 2002 and 2012 approximately 88,000t of *P. argus* was exported from the region totalling an estimated $2bn (Winterbottom et al., 2012). Due to the consistently high demand for spiny lobster, all species demand a relatively high price. Global supply primarily remains dependent on capture fisheries and these have either declined or show evidence that catches are at or above maximum sustainable yields [15]. In addition to large-scale export fisheries such as those in Bahamas, Cuba, and Honduras, it forms the basis for important artisanal fisheries on small Caribbean islands, such as St. Lucia.

Several Caribbean states are considering the development of aquaculture of this lucrative species, both as a means to reduce pressure on natural stocks but also to provide financial, employment and food security in rural communities. In this model, due to the complexity of the early life cycle of spiny lobsters, juvenile (planktonic) life stages are collected from the wild and on-grown in culture or 'ranch' conditions until reaching market size (e.g. http://www.csfbvi.com/about). In Vietnam, ranch culture of *Panulirus ornatus* has created a US$100 million industry in recent years [16]. However, although the ranching of panulirid lobsters clearly offers significant promise to such communities, the availability of juveniles and, particularly their health and disease status have become key considerations for longer-term industry sustainability [17,18].

This CME project addresses the economic and practical uncertainties around developing spiny lobster aquaculture in the Caribbean. It proposes a model for accessible aquaculture practices that support economic growth, ensure food security and reduce fishing pressure on existing stocks.

An initial disease screen of adult lobsters from waters around St. Lucia was conducted by Cefas. This provided the Department of Fisheries an assessment of the current health status of their lobster fishery and evaluated the suitability of St. Lucia for lobster aquaculture. The project identified Savannes Bay as an appropriate location for undertaking a 2-year pilot programme to culture lobsters to market size. Engagement with local sea-moss farmers has established a mechanism for knowledge transfer to facilitate adoption of sustainable aquaculture practices. Initial infrastructure development has already been established through collaboration with local fishers and government staff. Building on this foundation will enable the generation of the essential data required to create an aqua-economic model to support further growth of lobster aquaculture in the region.

Therefore, the benefits derived from this project will enable the identification of a process to ranch high-value lobsters with engagement from the local community. In addition, the project aims to provide a model for wider Caribbean application based on the lessons learned. The support from the programme was requested as there was not adequate expertise and capacity in the country to enable this applied research to be carried out.

3.4. Understanding and adapting to the impacts of climate change on fisheries

Small islands often have access to abundant marine resources with as much as 50–90% of animal protein derived from fish for Pacific island coastal communities [19]. However, these same islands are sensitive to overfishing, pollution and are disproportionately vulnerable to climate change [20]. The past century has already seen a decline in fish stocks and there could be a further 50% reduction in wild catch fisheries due to climate change. Regional fisheries are likely to be impacted by warming seas influencing the migration routes of pelagic fish and the overall distribution of high-value species. This presents challenges for SIDS both in relation to local food security and to economic stability and growth. In addition, extreme weather events can impact on safety and the infrastructure that enables subsistence and export fisheries.

The following text illustrates some examples of the projects that support sustainable fisheries management in the context of a changing climate.

3.4.1. Marine climate change impacts report card (fisheries topic)

The impacts of climate change on the marine and coastal environmental are of critical importance to small island developing states. The remote island locations of the states mean that they are particularly vulnerable to marine climate change, but there are similarities between islands, meaning that overarching information sources would be very valuable for the Caribbean and Pacific regions.

While there is a significant amount of research being carried out on the impacts of climate change in the marine environment, up until now, there has been no synthesis of the science that is accessible to a wide audience of non-specialists. Such information is required in international processes e.g. UN Conference of the Parties agreements, to attain adaptation funding, and to facilitate an understanding of evidence gaps and adaptation priorities.

As such, under the CME programme, alongside working groups and scientific experts within the regions, marine climate change report cards have been produced for the Caribbean[7] (the SIDS included in the report are Antigua and Barbuda, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, and Saint Vincent and the Grenadines). and the Pacific[8] (the SIDS included in the report are Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu). These cards are based around a concept developed by the Marine Climate Change Impacts Partnership.[9]

The advantage of these report cards over further scientific publications is that they are single, authoritative sources of information on marine (and coastal) climate change to help understand potential risks, and opportunities that countries face. They provide information in a straight-forward format which can then be used by individual countries or regions to understand their social and economic priorities for adapting to climate change, as well as taking advantages of potential benefits. The report cards can be used as a support tool to enable evidence-based decision making. Indeed, the Caribbean report card has been used as part of the evidence base for impacts at the 2018 Talanoa Dialogue meetings for the UN Framework Convention on Climate Change.

The report cards cover various topics including fish, shellfish and fisheries, and the habitats that support fish. Specific peer-reviewed papers on these topics have been produced covering SIDS in the Pacific and Caribbean regions, and the report cards themselves summarise this

[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/604876/Caribbean_Report_Card.pdf.

[8] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714511/CEFAS_Pacific_Islands_Report_Card_FINAL_AMENDED_Single-pages_LOW-RES.pdf.

[9] http://www.mccip.org.uk/.

information, so that fishing communities, marine managers, policy makers and governments can use it to prioritise actions. Recommendations are also made on how to build climate resilience within fisheries and associated habitats, and how climate change interacts with other human pressures, such as pollution and coastal erosion, and how these pressures can be managed.

The support from the programme was requested as there had not been a similar product developed in the regions and as such there was no institutional experience to develop and deliver a climate change report card at the regional scale.

3.4.2. Dominica

Fishing in Dominica is largely artisanal in nature [21] and has been a traditional occupation for coastal inhabitants [22] with many fishers operating at a subsistence [23] and artisanal level. The bulk of imported seafood products is in the form of salted cod from Canada [24,25] although, unlike many of its neighbours, Dominica neither imports nor exports substantial quantities of seafood [21]. As such, fishing communities in Dominica are thought to be especially vulnerable to long-term climate change and occasional catastrophic hurricanes.

The aims of the CME project in Dominica are to: (1) identify the commercial fish species in Dominica that are the most sensitive to long-term climate change; (2) examine the relative 'exposure' of different fishing ports and parishes in Dominica to climate change and climatic events; (3) consider the sensitivity of different communities in Dominica, based on their fishery dependence, level of specialization etc.; and (4) assess the relative 'adaptive capacity' of different communities based on indices of social vulnerability such as inequality, poverty, housing quality etc.

On September 18, 2017, Hurricane Maria hit Dominica. The impacts were severe for both the country's economy and citizens. The Post-Disaster Needs Assessment (CoD 2017) concluded that Hurricane Maria resulted in total damages of East Caribbean dollars (EC$) 2.51 billion (US$931 million) and losses of EC$1.03 billion (US$382 million), which amounts to 226% of the 2016 GDP. In total, 128 fishing vessels are estimated to have been damaged or destroyed. The total costs for repair and replacement of vessels and engines was estimated as EC$ 4.52 million (US$ 1.68 million). Other losses included fishing gear and vendor equipment estimated at EC$ 0.87 million (US$ 0.32 million) (CoD 2017).

The reports and advice derived from the programme support future adaptation planning, resilience and capacity building in the fisheries sector, with the aim to reduce the impact of future hurricanes and climate change.

The intervention was requested as even prior to the hurricane season of 2017 there was not enough expertise and capacity in the country to enable this process to assess the vulnerability in the fisheries sector.

3.4.3. Access to parametric insurance and development of climate smart fisheries

The majority of infrastructure and settlements in Caribbean islands are located on or near the coast, including health, fishing, markets and transportation facilities. These areas already face pressure from natural forces (wind, waves, tides, torrential rain etc.) and human activities (beach sand removal and inappropriate construction of shoreline structures). Tropical hurricanes and other major weather events can disproportionately impact the fishing sector preventing fishing activities, before, during and after the events. Furthermore, fishing communities also suffer from loss of assets (vessels, fishing gear etc.), reduced coverage and quality of public services such as electricity, piers, and roads after such events, further hampering the potential to catch, preserve and deliver product to market with disproportionate impacts on the poor.

There is a need to understand what assets are vulnerable to climatic events and the extent to which fisheries have developed to adapt to climate change. Importantly, there is a need to enable quick access to insurance pay-outs following severe weather.

In response, a new partnership between the US State Department, the World Bank, the Caribbean Catastrophe Risk Insurance Facility[10] (CCRIF SPC), the Caribbean Regional Fisheries Mechanism (CRFM) and the FAO has developed the Caribbean Oceans, Aquaculture Sustainability Facility (COAST[11]) climate risk parametric insurance product for vulnerable fishing communities. Parametric insurance is designed to 'pay out' after a triggering event. COAST will be designed to quickly put money and human resources into the recovery effort of fishing communities immediately after a pay-out is triggered by high winds, storm surge and/or excessive rainfall. At the same time COAST will be designed to:

- Increase the number of fishers who benefit from climate risk insurance;
- Incentivise countries to implement the Caribbean Community Common Fisheries Policy (CCCFP);
- Encourage countries to develop coordinated disaster management plans for the fisheries sector; and
- Encourage development to improve coastal resilience and support improved fisheries governance and conservation.

To enable the implementation of the product the key aims of this project are to develop a fisheries assessment methodology to be used to develop the insurance product, that will:

- Provide a means to quantify national progress towards sustainable fishing and climate resilience; and
- Provide a means to quantify exposure, hazard and vulnerability of the fisheries sector to climatic events.

The project initiated with several states including Jamaica and Belize. The project will support the structured qualitative assessment of these aspects through scorecard and data assessment/availability processes.

The benefits of this project and successful implementation of the product will be the increased speed of access to targeted insurance pay-outs, implementation of sustainable fishing practices (CCCFP) and region-wide co-ordinated disaster management plans. Intervention was requested by the stakeholders and World Bank as this novel approach to providing insurance could not be resourced by local government departments.

4. Conclusions

4.1. Economic case for ODA support to the fisheries sector

In summary, ODA support to sustainable fisheries programmes is expected to produce benefits, especially in countries where the fisheries sector employs large numbers of people and/or the populations that depend on locally caught fish to provide protein.

A decrease in ODA funding for sustainable fisheries can be attributed to a multitude of reasons. Assessing the true economic benefits is challenging and requires data on e.g. stock sizes [26]. However, often this data does not exist, and ironically, is the basis for the request for assistance. In addition, other aid programmes that are not classified as fisheries development programmes may often have fisheries components within them making benefit identification more difficult. Therefore, lack of relevant data can potentially explain the decreased flow of

[10] https://www.ccrif.org/.

[11] http://www.worldbank.org/en/news/feature/2016/01/07/as-climate-change-hits-the-caribbean-partners-collaborate-to-boost-resilience-and-rejuvenate-coasts.

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funds towards supporting sustainable fisheries with an inability of implementing agencies to describe baselines and changes to those baselines in timescales that meet the needs of funding bodies. Describing the economic benefits is important to demonstrate a proven "track record" of successful application of ODA in supporting sustainable fisheries and reducing the risk of investment. Addressing the issue of clearly quantified economic benefits from ODA can help articulate the requirement for funding the fisheries sectors in developing states [1].

This paper provides an overview of two key UK Government funded programmes. While the programmes (and projects) are in varying states of maturity, and in some cases are recently initiated, it demonstrates the breadth and depth of the activities that are possible through cross-government activity and spells out the potential to create sustainable market access, job and food security, and climate resilient fisheries across wide geographic expanses. Some of these benefits are relatively easy to quantify and are often digital or relatively easy to distinguish from failure (e.g. access/lack of access to market through MSC certification, successful sustainable aquaculture initiatives etc). However, many other projects require monitoring and evaluation criteria that are meaningful within timescales that meet the needs of funders and enable demonstrable ecological/socio-economic outcomes.

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